

## WHAT IS CLAIMED IS:

1. A heater inspection apparatus comprising:
  - an applying unit that applies a power element to a heater heated based
  - 5 on an AC power source;
  - a current detector that detects a current flowing through the heater when the power element is applied to the heater by said applying unit;
  - a voltage detector that detects a voltage applied to the heater when the power element is applied to the heater by said applying unit;
  - 10 a temperature detector that detects a temperature of the heater being heated by said applying unit;
  - a memory on which a temperature coefficient of resistance for use in calculation of a resistance of the heater at a reference time is stored in advance;
  - 15 a first calculating unit that calculates a resistance of the heater at an inspection time based on respective detection results of said voltage detector and said current detector;
  - a second calculating unit that calculates the resistance of the heater at the reference time based on a detection result of said temperature detector and the temperature coefficient of resistance stored on said memory; and
  - 20 a finding unit that finds a deterioration degree of the heater based on the resistance of the heater at the inspection time calculated by said first calculating unit and the resistance of the heater at the reference time calculated by said second calculating unit.
- 25 2. A heater inspection apparatus according to claim 1,
  - wherein said applying unit that applies the power element is the AC power source that heats the heater,
  - wherein said current detector detects a level of a current flowing
  - 30 through the heater when an AC voltage is applied to the heater by said AC power source,
  - wherein said voltage detector detects a level of a voltage applied to

the heater when the AC voltage is applied to the heater by said AC power source, and

wherein said temperature detector detects a temperature of the heater being heated by the AC power source.

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3. A heater inspection apparatus according to claim 1, further comprising

an interrupting unit that interrupts a route between the AC power source and the heater heated based on the AC power source,

10 wherein said applying unit that applies the power element is a DC power source that applies a DC voltage to the heater when said interrupting unit is interrupting the route,

wherein said current detector detects a current flowing through the heater when the DC voltage is applied to the heater by said DC power source,

15 wherein said voltage detector detects a DC voltage applied to the heater when the DC voltage is applied to the heater by the DC power source, and

wherein said temperature detector detects a temperature of the heater being heated by said DC power source.

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4. A heater inspection apparatus according to claim 1, further comprising

an interrupting unit that interrupts a route between the AC power source and the heater heated based on the AC power source,

25 wherein said applying unit is a DC constant current source that supplies a constant direct current to the heater irrespective of whether the route is interrupted or not interrupted by said interrupting unit,

wherein said current detector detects a current made to flow through the heater by the DC constant current source, while the route is being  
30 interrupted by said interrupting unit,

wherein said voltage detector detects a DC voltage applied to the heater by the DC constant current source, while the route is being interrupted

by said interrupting unit, and

wherein said temperature detector detects a temperature of the heater being heated by the DC constant current source, while the route is being interrupted by said interrupting unit.

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5. A heater inspection apparatus according to claim 3 or claim 4, wherein said interrupting unit obtains, from the route connecting the AC power source and the heater, a power source synchronization signal of a power source applied to the heater and interrupts the route based on the power source synchronization signal.

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6. A heater inspection apparatus according to any one of claim 1 to claim 4, further comprising

15 a warning unit that gives a warning that the heater needs replacement when a result of the finding of the deterioration degree of the heater by said finding unit indicates that the heater needs replacement.

7. A heater inspection apparatus according to any one of claim 1 to claim 4,

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wherein said memory further stores a length and a cross sectional area of the heater at the reference time.

8. A semiconductor manufacturing apparatus, comprising a heater inspection apparatus according to any one of claim 1 to claim

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